PTO/SB/68 (04-01)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR ACCESS TO AN APPLICATION UNDER 37 CFR 1.14(e)

In re Application of	
BARCUS	
Application Number: 07/439093	Filed: 11/17/89
Art Unit	Examiner

Paper No. 19

Assistant Commissioner for Patents
Washington, DC 20231

1. ☐ I hereby request access under 37 CFR 1.14(e)(2) to the application file record of the above-identified ABANDONED Application, which is not within the file jacket of a pending Continued Prosecution Application (CPA) (37 CFR 1.53(d)) and is: (CHECK ONE)

   ☑ (A) referred to in:

   United States Patent Application Publication No. _____, page _____, line_____,

   United States Patent Number 6451567, column _____, line _____, or

   an International Application which was filed on or after November 29, 2000 and which designates the United States, WIPO Pub. No. _____, page _____, line_ ____.

   ☐ (B) referred to in an application that is open to public inspection as set forth in 37 CFR 1.11(b) or 1.14(e)(2)(i), i.e., Application No._____, paper No. _____, page _____, line _____.

2. ☐ I hereby request access under 37 CFR 1.14(e)(1) to an application in which the applicant has filed an authorization to lay open the complete application to the public.

RECEIVED
02 DEC 24 AM 8:44
TECH CENTER 1600/2900

Signature

12/24/02
Date

Rick Toman
Typed or printed name

FOR PTO USE ONLY
Approved by: _____ (initials)
Unit: _____

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

US006451567B1

(12) **United States Patent**
Barclay

(10) **Patent No.: US 6,451,567 B1**
(45) **Date of Patent: Sep. 17, 2002**

(54) **FERMENTATION PROCESS FOR PRODUCING LONG CHAIN OMEGA-3 FATTY ACIDS WITH EURYHALINE MICROORGANISMS**

(75) Inventor: **William R. Barclay**, Boulder, CO (US)

(73) Assignee: **Omegatech, Inc.**, Boulder, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/461,709**

(22) Filed: **Dec. 14, 1999**

Related U.S. Application Data

(63) Continuation of application No. 08/968,628, filed on Nov. 12, 1997, now abandoned, which is a continuation of application No. 08/461,137, filed on Jun. 5, 1995, now Pat. No. 5,688,500, which is a continuation of application No. 08/292,490, filed on Aug. 18, 1994, now Pat. No. 5,518,918, which is a continuation of application No. 07/962,522, filed on Oct. 16, 1992, now Pat. No. 5,340,742, which is a continuation-in-part of application No. 07/911,760, filed on Jul. 10, 1992, now Pat. No. 5,340,594, which is a continuation of application No. 07/580,778, filed on Sep. 11, 1990, now Pat. No. 5,130,242, which is a continuation-in-part of application No. 07/439,093, filed on Nov. 17, 1989, now abandoned, which is a continuation-in-part of application No. 07/241,410, filed on Sep. 7, 1988, now abandoned.

(51) **Int. Cl.**[7] **C12N 1/00**; C12N 1/12; C12P 1/02; C12P 39/00; C12P 7/64

(52) **U.S. Cl.** **435/134**; 435/42; 435/135; 435/171; 435/243; 435/257.1; 435/946

(58) **Field of Search** 435/243, 257.1, 435/946, 134, 42, 171, 135

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,296,079	A	1/1967	Griffin	167/93
3,647,482	A	3/1972	Yueh	99/141
3,667,969	A	6/1972	Kracauer	99/141
3,908,026	A	9/1975	Neely et al.	426/538
3,908,028	A	9/1975	Neely et al.	426/538
3,924,017	A	12/1975	Lee et al.	426/548
4,304,794	A	12/1981	Dwivedi et al.	426/548
4,670,285	A	6/1987	Clandinin et al.	426/602
4,758,438	A	7/1988	Stroz et al.	426/3
4,792,418	A	12/1988	Rubin et al.	554/186
4,871,551	A	10/1989	Spencer	426/2
5,012,761	A	5/1991	Oh	119/6
5,130,242	A	7/1992	Barclay	435/134
5,133,963	A	7/1992	Ise	424/94.61
5,272,085	A	12/1993	Young et al.	435/254.2
5,340,594	A	8/1994	Barclay	426/5
5,340,742	A	8/1994	Barclay	435/256
5,415,879	A	5/1995	Oh	426/2
5,492,828	A	2/1996	Premuzic et al.	435/245
5,518,918	A	5/1996	Barclay	435/257.1
5,547,699	A	8/1996	Iizuka et al.	426/615
5,688,500	A	11/1997	Barclay	424/93.1

FOREIGN PATENT DOCUMENTS

EP	0 231 904 A2	8/1987
FR	1/557/635	2/1969
JP	58-196068	5/1985
JP	58-213613	6/1985
JP	60-105471	10/1985
WO	WO 88/10112	12/1988
WO	WO 89/00606	1/1989
WO	WO 91/14427	10/1991
WO	WO 92/12711	8/1992

OTHER PUBLICATIONS

Ainsworth, "Introduction and Keys to Higher Taxa.", pp. 1–7, 1973, in *The Fungi. An Advanced Treatise*, vol. 4B, (G.C. Ainsworth et al. eds., Academic Press).

Bahnweg et al., "A New Approach to Taxonomy of the Thraustochytriales and Labyrinthulales", pp. 131–140, 1986, in *The Biology of Marine Fungi*, (S.T. Moss ed., Cambridge University Press).

Bartnicki–Garcia, "The Cell Wall: A Crucial Structure in Fungal Evolution", pp. 389–403, 1988, in *Evolutionary Biology of the Fungi*, (A.D.M. Rayner et al. eds., Cambridge University Press).

Behrens et al., "Eicosapentaenoic Acid from Microalgae", p. 623, col. 2, abstract No. 193025d, 1989, Chemical Abstracts, vol. 111, No. 21, Nov. 20.

Cavalier–Smith, "The Origin of Nuclei and of Eukaryotic Cells", pp. 463–468, 1975, *Nature*, vol. 256.

Cerda–Olmeda et al., "A Biography of *Phycomyces*", pp. 7–26, 1987, in *Phycomyces*, (Cerda–Olmeda et al. eds., CSH Laboratory).

Couch et al., 1973, *Lipids*, 8(7):385–392.

Cruickshank, 1934, "Studies in Fat Metabolism in the Fowl" in *Biochem. J.*, 28:965–977.

Dick, "Saprolegniales", pp. 113–144, 1973, in *The Fungi. An Advanced Treatise*, (G.C. Ainsworth et al. eds., Academic Press).

(List continued on next page.)

Primary Examiner—David M. Naff
Assistant Examiner—Deborah K. Ware
(74) *Attorney, Agent, or Firm*—Sheridan Ross P.C.

(57) **ABSTRACT**

A process is provided for growing the microflora Thraustochytrium, Schizochytrium, and mixtures thereof, which includes the growing of the microflora in fermentation medium containing non-chloride containing sodium salts, in particular sodium sulfate. In a preferred embodiment of the present invention, the process produces microflora having a cell aggregate size useful for the production of food products for use in aquaculture. Further disclosed is a food product which includes Thraustochytrium, Schizochytrium, and mixtures thereof, and a component selected from flaxseed, rapeseed, soybean and avocado meal. Such a food product includes a balance of long chain and short chain omega-3 highly unsaturated fatty acids. Further, a process for producing lipids includes a fermentation by growing euryhaline microorganisms which are capable of producing 1.08 grams per liter of the fermentation medium per day of long chain omega-3 fatty acids per 40 grams of sugar per liter of the fermentation medium at a sodium ion concentration of 60% seawater. The lipids are then extracted from the euryhaline microorganisms.

14 Claims, 8 Drawing Sheets